CHAPTER 1. INTRODUCTION

The SWIM Act

The Florida Legislature enacted the Surface Water Improvement and Management (SWIM) Act (Chapter 373.451-373.4595, F.S.) in 1987 and revised it in 1991. This Act declares that many natural surface water systems in Florida, including the Indian River Lagoon (IRL), have been or are becoming degraded. Factors contributing to this degradation include point and non-point sources of pollution and the destruction of natural habitats. The SWIM Act directed the St. Johns River and South Florida Water Management Districts, with the cooperation of state agencies and local governments, to design and implement a plan for the improvement of surface waters and habitats in the IRL.

The Districts complied with this mandate in the development of the 1989 SWIM Plan for the Indian River Lagoon, which was updated in 1994. This 2002 plan document serves as the second update of the plan. It includes a status report on the state of the Lagoon, a summary of progress on projects undertaken since the last update in 1994, and recommendations for future projects and other actions over the next 5 years. This plan update, like the 1989 and 1994 plan documents, received reviews by the general public (via public workshops) and by appropriate state, federal, and local agencies, many of which have been active partners with the Districts in implementing the plan since 1989. Additional detail on the formal plan review process is provided in the 1994 IRL SWIM Plan (Chapter 1, pp.1 – 8).

The Evolution of the IRL SWIM Plan

What's New About the 2002 IRL SWIM Plan Update

The main purpose of this document is to provide an update of the SWIM Plan and its programs and projects since 1994. As such, the content is devoted primarily to progress and accomplishments since 1994, any programmatic changes since 1994, and what is planned over the next 5 years.

The reader is advised to have a copy of the *1994 SWIM Plan for the Indian River Lagoon* on hand as a reference to obtain background and progress information relevant to the many projects that were started during the 1987 – 1994 period. There is frequent reference made to the 1994 IRL SWIM Plan and its appendices throughout this plan update. Two other documents are also recommended as useful technical references concerning the IRL system and its resources: The IRL Reconnaissance Report (SJRWMD and SFWMD, 1987) and the series of the IRL characterization reports developed by Woodward-Clyde Consultants for the IRL National Estuary Program (1994).

The most obvious change is the layout of this 2002 plan document compared to the 1994 and 1989 IRL SWIM plans. The content of the earlier plan documents are organized by program; each program serving as a major chapter or section heading: Water and Sediment Quality; Habitat Preservation and Restoration; Regulation and Enforcement; Public Awareness; and Administration, Planning, and Coordination. This document, however, is organized by geographic regions, beginning with a chapter

offering a *Lagoon-wide Overview* (Chapter 2), followed by chapters on the major sub-lagoon areas: *Mosquito Lagoon* (Chapter 3)*, Banana River Lagoon* (Chapter 4)*, North and Central IRL* (Chapter 5)*, South IRL* (Chapter 6)*, and St. Lucie River* (Chapter 7). This 2002 Plan update is designed so that a reader with an interest in a particular sub-lagoon area can find most of the relevant information within a single chapter. Hopefully, by this format change, the reader will find this update more useful and interesting.

Within each chapter, content is organized by program; but the program titles and content have changed reflecting an evolution of the programs and their functions. The new programs are *Seagrass & Water Quality, Coastal Wetlands, and Public Involvement & Education.*

Seagrass & Water Quality. This program and the 2002 plan update reflect the increasing focus on the relationship between water quality and seagrass productivity and diversity. The recovery and maintenance of healthy seagrass beds is the program's emphasis. The fundamental pre-requisite to seagrass recovery is the improvement in water clarity, allowing more sunlight to penetrate deeper into Lagoon waters, enabling the expansion of seagrass beds. Therefore, water quality monitoring, pollutant load reduction goals (PLRGs), and remediation projects have become more specific to what is required to improve water clarity and light penetration.

In each of the following chapters, 2 – 6, the Seagrass and Water Quality section includes a summary of the Districts' assessment of seagrass and water quality status and trends during the past decade, 1990 through 1999. Provisional PLRGs, expressed as "allowable" loading targets, are presented by SJRWMD for Mosquito and Banana River lagoons, and North and Central IRL. SFWMD presents pollutant concentration targets for the South IRL. At the end of this section, there are discussions on the remediation strategies and projects intended to help achieve the PLRGs or water quality targets.

Coastal Wetlands. This program replaces the Habitat Preservation and Restoration program and its related chapter or sectional narratives in the 1989 and 1994 IRL SWIM plans. Seagrass management was removed from this program and merged with water quality as explained above. Wetland management remains focused on the rehabilitation of salt marsh and mangrove habitats, but new initiatives are also underway. This important and expanding program is integral to the holistic management of the IRL system. Accomplishments have been tremendous, but much remains to be done. This program's significance, its progress, and where it's heading are explained in the chapters that follow.

Public Involvement and Education (PIE). This program was entitled *Public Awareness* in the previous IRL SWIM plans. The PIE program is a Lagoon-wide campaign and, as such, is covered only in Chapter 2 (Lagoon-Wide Overview). The goal of PIE has not changed, but the program's scope has broadened since the mid-1990s when the IRL National Estuary Program assumed responsibility for it.

Other Programmatic Changes. Two other SWIM programs, Regulation & Enforcement (R&E) and Administration, Planning, & Coordination (APC), have been subsumed by the three new programs described above. For example, the objectives served by the R&E Program are now made part of the Seagrass & Water Quality and Coastal Wetlands programs. These changes reflect the evolution of the IRL SWIM Plan and the pursuit of efficiency and improved coordination.

Issues, Goals and Objectives

The management issues have not changed substantively since the 1994 IRL SWIM Plan update. Please refer to Chapter II of the 1994 IRL SWIM Plan, pp. 9 – 16, for a discussion of the issues. Since 1994, many of the issues have been further clarified and made more manageable through investigative and remediation efforts. This should become apparent to the reader upon further review of this 2002 SWIM Plan update.

The three major goals of the IRL SWIM Plan, first stated in the 1989 IRL SWIM Plan and re-stated in the 1994 IRL SWIM Plan (Chapter III, p. 19), have remained intact and relevant. The goals are as follows:

> *Goal I. To attain and maintain water and sediment of sufficient quality (". . . to Class III or better . . .", Chapter 373.453, F.S.) in order to support a healthy, macrophyte-based, estuarine lagoon ecosystem.*
>
> *Goal II. To attain and maintain a functioning macrophyte-based ecosystem which supports endangered and threatened species, fisheries and wildlife.*
>
> *Goal III. To achieve heightened public awareness and coordinated interagency management of the Indian River Lagoon ecosystem that results in the accomplishment of the two aforementioned goals.*

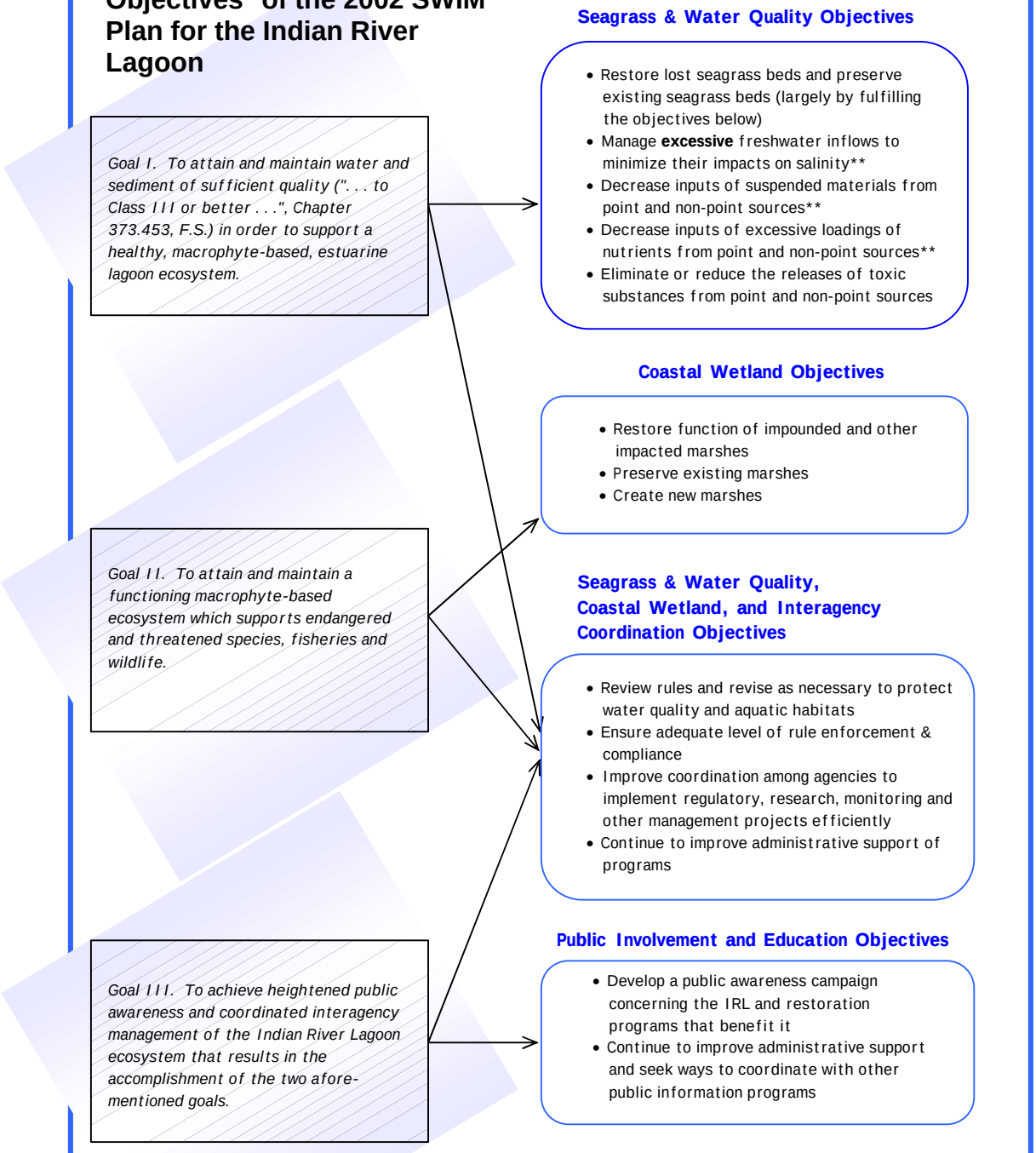
Although the goals have remained unchanged, that is not the case with the original set of general objectives (1994 IRL SWIM Plan, Chapter III, p. 21). The objectives have evolved with the programs since 1994. The objectives of the old R&E and APC programs are now handled under the new *Seagrass & Water Quality* and *Coastal Wetlands* programs. The seagrass management objectives are now addressed under the *Seagrass & Water Quality* program. The objectives dealing with marsh restoration, preservation, and creation are addressed under *Coastal Wetlands*.

The most substantive change is the removal of one of the original water quality objectives: *"Reduce …coliform bacteria in shellfish harvesting areas…"* (see 1994 IRL SWIM Plan, p. 21). That objective, as stated, can be misconstrued as suggesting that the Districts are accountable for monitoring and meeting background coliform or state bacteriological standards in shellfish harvesting areas. The Districts do not have that authority[1]. Nonetheless, the Districts believe that substantial reductions in coliform bacteria loading to the IRL can occur when the other water quality objectives of the Plan are addressed. This "coliform objective" is now viewed as an ancillary benefit to the IRL if Goal I and its current set of water quality objectives are achieved.

In summary, the revised set of objectives is presented in Figure 1-1 along with their corresponding goals.

[1] Florida Department of Agriculture and Consumer Services (via Shellfish Environmental Assessment Section) is responsible for monitoring the bacteriological condition of shellfish waters. The counties' public health agencies and FDEP play a role in preventing or controlling sources of bacteriological contamination in ambient waters and potable water supplies.

Figure 1-1. Goals and Objectives* of the 2002 SWIM Plan for the Indian River Lagoon



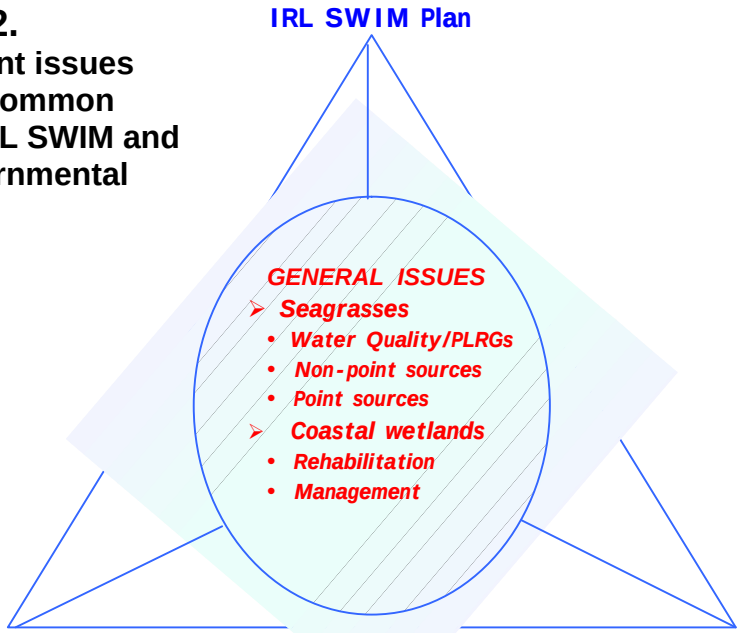
* The set of objectives above are slightly different from those in the 1994 IRL SWIM Plan. Please read Chapter 1, p. 1-3 for an explanation of changes.

** Objective served by development of and compliance with Pollutant Load Reduction Goals (PLRGs), which would be considered in the development of federal and state Total Maximum Daily Loads (TMDLs).

Relationship to Other Programs and Plans

It is both a goal and a necessity that the IRL SWIM Plan and its programmatic activities coordinate with other agency plans or programs. Rather than acting alone, it's more advantageous and prudent for the IRL SWIM programs to engage with other governmental programs to ensure that goals are consistent in the management of seagrasses, pollution controls (PLRGs, non-point and point sources), and coastal wetlands (Figure 1-2). It makes sense to coordinate with other agency programs to achieve mutual aims, prevent or minimize management conflicts, and conduct cost-effective and efficient projects. Also, it's a budgetary necessity for the Districts and other governmental programs to cost-share the expenses associated with restoration monitoring, applied research, and management. For these reasons, the Districts' IRL SWIM programs closely coordinate with several federal, state, and local management plans and programs. Those plans and programs that are described below are currently in the forefront of IRL management (Figure 1-2).

Figure 1-2.
Management issues shared in common between IRL SWIM and other governmental programs



Other Florida Programs

- Florida Dept. of Environmental Protection administration of National Pollution Discharge Elimination System and development/implementation of Total Maximum Daily Loads (TMDLs)
- State Aquatic Preserves (FL Dept. of Environmental Protection)
- FL Inland Navigation District, SJRWMD, SFWMD, and water control district plans for dredge, water supply, and local drainage programs, respectively
- Florida Dept. of Community Affairs – State & Local Growth Comprehensive Plans
- Florida Dept. of Agriculture and Consumer Services (aquaculture, shellfish waters, mosquito control districts and management of coastal wetlands)

ederal Programs

- IRL National Estuary Program (EPA & WMDs) and EPA's Clean Air Status and Trends Network
- TMDLs & NPDES – EPA Guidance & Oversight (PLRGs -> TMDLs)
- National Wildlife Refuge and National Park Service Plans (especially the USFWS and NPS management of coastal wetlands)
- NASA's environmental programs
- Comprehensive Everglades Restoration Plan -- South and North IRL Feasibility Studies (U.S. Army Corps of Engineers, SFWMD, and SJRWMD)

Additionally, there are numerous public and private grant programs that can support the implementation of the SWIM Plan. Information on public and private grant programs can be obtained from IRL National Estuary Program office located at the SJRWMD Palm Bay Service Center. That program routinely updates and disseminates current lists and descriptions of grant opportunities.

Federal Plans and Programs

The IRL National Estuary Program. The EPA's National Estuary Program was established in 1987 as Section 320 of the Clean Water Act. In 1990, following resolutions of support by the Governor and the Districts, the Indian River Lagoon was proclaimed an Estuary of National Significance, and the IRL National Estuary Program (IRLNEP) was established. Two organizational aspects of the program were immediately set in motion: 1) an IRLNEP management group or " Management Conference" representing SJRWMD, SFWMD, state, local and federal agencies; and 2) the selection of the SJRWMD as the IRLNEP sponsor whose responsibilities include providing staff support and the local administration of federal funds. A cooperative agreement between the SJRWMD and the EPA was signed on January 4, 1991.

Between 1991 and 1996, the main objective of the IRLNEP, facilitated by both the SJRWMD and SFWMD, was to have the conference agencies[2] agree on goals and related actions for restoration and protection of the Lagoon and document such an agreement in a Comprehensive Conservation and Management Plan (CCMP). The CCMP was completed in 1996 and is now being implemented in concert with the IRL SWIM Plan. In fact, the CCMP adopted the same three goals found in the IRL SWIM Plan (see SWIM goals above); but also proposed a fourth goal (which concerns long-term commitments toward CCMP implementation) as well as other applied research, education, planning, and "action now" activities.

The IRLNEP has built upon the IRL SWIM mission and its accomplishments, furthering the restoration campaign for the IRL system. The IRLNEP fostered active participation by other federal agencies, notably the U.S. Fish and Wildlife Service, NASA, and the U.S. Army Corps of Engineers. It also manages a local government cost-share program that assists counties and municipalities with planning and implementing pollution abatement projects, which are typically small-scale with an emphasis on stormwater treatment. In recent years, the IRLNEP has tackled some of the important and controversial issues in the IRL Basin such as septic tanks and reverse osmosis treatment facilities as potential sources of pollution. Since 1994, the IRLNEP has assumed complete responsibility for the Public Awareness Program initiated under SWIM in 1987 (the program is now called Public Involvement and Education; pp. 238 – 251 in the CCMP). Furthermore, the IRLNEP office provides budget administrative support to all SJRWMD's IRL projects (regardless of funding source) in addition to its administration of EPA IRLNEP funds and IRL license plate revenues for both Districts and the counties of the IRL Basin.

[2] Most of these conference agencies are now represented on the IRLNEP Advisory Committee. Information on Committee representation and function can be obtained from the IRLNEP office at SJRWMD's Palm Bay Service Center.

The EPA's National Pollution Discharge Elimination System (NPDES) Program. The counties and nearly all municipalities in the IRL basin are required to apply to Florida Department of Environmental Protection (FDEP) for a general permit under the U.S. EPA's NPDES Phase 2 municipal separate storm sewer system (or MS4). FDEP administers this program in Florida on behalf of EPA[3]. The NPDES permit application must be completed in 2003; and the permitted program should be implemented by 2008. As part of the application, the counties and cities must develop a stormwater management plan and program that controls surface water (stormwater) pollution to the maximum extent feasible. At a minimum, the program must implement and set measurable goals for each of the following six elements: *1) public education, 2) public participation, 3) illicit discharge detection and elimination, 4) construction site stormwater controls; 5) post-construction controls; and 6) pollution prevention/good housekeeping for municipal operations*

The SJRWMD and SFWMD can assist local governments, at some level, in accomplishing most of the elements listed above. Both Districts, through the IRL SWIM and NEP programs, have assisted the counties and many of the cities and towns in developing surface water management plans and associated source control data (land use coverage, drainage maps, pipe and canal outfall locations, topographic and geotechnical data for best management practice [BMP] design, etc.). The Districts will continue to provide such support insofar as the intended local government actions help to achieve PLRGs or other SWIM/NEP objectives. Public education and participation projects promote public understanding of the relationship between stormwater management and a healthy Lagoon, and enable "grassroots" participation in projects. Both Districts cost-share with local governments in the planning and construction of BMPs designed for runoff storage/treatment. Work of this type that has been accomplished prior to 1994 is described in the 1994 IRL SWIM Plan (specifically pp. 30 – 53, 69 –74, and 78 – 79), and work since 1994 is described in this 2002 SWIM Plan update (in the non-point source strategy sections in each of the subsequent chapters).

As the local governments prepare their permit applications and corresponding plans, the Districts will be prepared to review the draft plans to ensure consistency with the PLRGs established for their respective jurisdictions, and to determine whether their programs and strategies appear to be capable of meeting those targets.

National Park and National Wildlife Refuge Plans. The National Parks (National Park Service) and the National Wildlife Refuges (U.S. Fish and Wildlife Service), both under the U.S. Department of the Interior, manage extensive areas of open waters and uplands, and over half of the wetland acreage, in the IRL Basin[4].

[3] Congress through the Water Quality Act of 1987 mandated the EPA to develop a tiered implementation strategy for the NPDES Storm Water Program. Phase I was implemented for major urban centers =100,000 people. Phase II handles local government jurisdictions of <100,000 people.

[4] Maps depicting boundaries of the Canaveral National Seashore and the National Wildlife Refuges in the IRL Basin are found in the IRL Joint Reconnaissance Report, Chapter 6 (SJRWMD and SFWMD, 1987).

Canaveral National Seashore (managed by NPS) covers the southern two-thirds of Mosquito Lagoon. *Merritt Island National Wildlife Refuge* (*MINWR*) also has management responsibility over a significant portion of the southern Mosquito Lagoon. Additionally, *MINWR* manages nearly all of North Merritt Island inclusive of northern Banana River Lagoon, extending from the Canaveral Barge Canal (near S.R. 528) to north of Haulover Canal just inside Volusia County. *Pelican Island National Wildlife Refuge* (the first National Refuge established in the country) covers about 14 sq mi of IRL immediately south of Sebastian Inlet. *Hobe Sound National Wildlife Refuge* covers about a 10-mile length of Hobe Sound, including 4 miles of barrier island.

The National Park Service (NPS) and U.S. Fish and Wildlife Service (USFWS) are evaluating their policies and activities as they relate to their long-standing, land management directives while giving serious consideration to current management issues or problems. The evaluations of management aims and activities, and any proposed adjustments to them, will be documented in their respective management plans.

The Canaveral National Seashore is revising its 1982 Water Resources Management Plan. The new plan was completed by the NPS in December 2001. The plan is intended to guide water-related management and public use activities over the next 5 to 10 years. Examples of the management issues that the plan emphasizes are protection of shellfish beds (oysters primarily) and seagrasses by regulating human uses in the southern Mosquito Lagoon, addressing pollution impacts whether originating within or outside the park boundaries, and improving marsh management practices to provide more complete ecological benefits inclusive of protections to federally listed species.

The Refuge Comprehensive Conservation plans for Merritt Island, Pelican Island, and Hobe Sound are in development by USFWS and may be completed by 2003. Each plan will deal with its own issues related to water and land resources and how best to regulate human activities within Refuge boundaries. The Refuge plans have a lifespan of 15 years before they are revised. Considering the expanse of land and water that the three Refuges manage -- well over 150,000 acres in the IRL Basin -- it's important for both the Districts and USFWS to review or assist in the development of their respective plans to ensure consistency among their goals and objectives.

The planning by NPS and USFWS is an excellent opportunity for the Districts to collaborate with those agencies on projects that can improve upon the holistic management of estuarine systems, such as seagrasses and coastal wetlands. Examples of current and potential collaborations are presented in some of the subsequent chapters (e.g., Canaveral National Seashore/ Mosquito Lagoon, Chapter 3; Wetlands Management Research Initiative in MINWR/North IRL, Chapters 2 and 5).

The IRL South and North Feasibility Studies (U.S. Army Corps of Engineers and the Districts). During the late 1940s through early 1970s, extensive drainage works were constructed by the U.S. Army Corps of Engineers (USACE) throughout central and southern Florida -- in the Upper St. Johns River, Kissimmee River, Lake Okeechobee, and Everglades basins -- for purposes of flood control. This major flood control project, known as the Central and Southern Florida Project, created a variety of unanticipated environmental impacts, not only to the aforementioned basins but also to the IRL that receive diverted, augmented drainage from the Project. The USACE and its non-federal sponsors, SFWMD and SJRWMD, have embarked on long-term programs, 15 years or

more, to rehabilitate the degraded environmental quality and ecological functions of the affected ecosystems.

These programs are being conducted under Congressional authority through the Water Resources Development Act (WRDA) and the Comprehensive Everglades Restoration Plan (CERP). The first phase of these programs is a *feasibility study* whose purpose is to diagnose the impacts and evaluate the feasibility and costs of remedial alternatives. The IRL system is, of course, a subject of these feasibility studies

The IRL is divided into two study areas: IRL-South (South IRL and St. Lucie River sub-basins in SFWMD) and IRL-North (the SJRWMD portion of the IRL system). The IRL-South Feasibility Study was conducted over the last five years and its final report can accessed via internet: www.evergladesplan.org. The IRL-North Feasibility Study was recently initiated in 2002[5] and is scheduled to conclude by 2008. Under the feasibility studies, the USACE and the Districts evaluate the efficacy of restoration alternatives and recommend those that can achieve the intended purpose, are practical, and are cost-effective. The feasibility study reports are essentially plans that include recommended watershed or regional construction projects, along with their conceptual designs and budgets. For example, the studies can recommend large-scale projects whose purpose would be to attenuate excessive freshwater discharges and/or treat the quality of surface water drainage to the IRL system. Still other types of projects can be proposed to restore Lagoon water quality or enhance wetlands.

The IRL-South F.S. and IRL-North F.S. reports will be submitted to Congress for approval via the re-authorization of WRDA in 2004 and 2008, respectively. WRDA re-authorization could mean a federal appropriation of up to several hundreds of millions of dollars to implement the recommendations of the reports. For successful implementation, the Districts would also need to follow through on their commitments.

This level of federal involvement in an estuarine restoration effort is unprecedented. It is anticipated that this joint USACE/WMD program will ensure the future success of the IRL restoration programs, both SWIM and IRLNEP.

State, Regional, and Local Programs

State Programs. The discussion here should start with the relationship between the Districts and the Florida Department of Environmental Protection (FDEP). The FDEP is the state's lead administrative agency that reviews the policies and actions of the state's five water management districts relative to the State Water Policy and its related plans (e.g., State Comprehensive Plan, Florida Water Plan, District Water Management Plans). The FDEP administers the NPDES program in the state on behalf of U.S. EPA (please refer to p. 1-7 for more information about the NPDES program). In addition, the FDEP is the agency that administers the SWIM Act on behalf of the state, establishing SWIM plan development and implementation guidance policies pursuant to the Act, and serving as the primary state agency that reviews the SWIM plans and their revisions or updates (Chapter 373, F.S.). The FDEP and the water management districts have also established the general guidance and schedules for the development of PLRGs, which the Districts have

[5] According to the USACE, a link to the IRL-North Feasibility Study will be developed in 2003 through the web page at www.evergladesplan.org.

the authority to establish (Chapter 62-40, F.A.C.)[6]. The FDEP, through its Bureau of Watershed Management, is delegated by U.S. EPA to develop and implement Total Maximum Daily Loads (TMDLs) with the intent to adopt or, at minimum, be consistent with the Districts' recommended PLRGs. Similar to a PLRG, a TMDL is the maximum amount of a given pollutant that the estuary can absorb and still maintain its designated use (e.g., suitable for fishing or swimming). For details on the development and implementation of TMDLs in the IRL system and throughout the state, please refer to Appendix A.

A summary description of the programmatic linkages between FDEP and the Districts is covered in the 1994 IRL SWIM Plan (Chapter I, pp. 2 – 6). On a project level, both the SJRWMD and SFWMD frequently coordinate with FDEP's divisions and district offices[7] regarding water quality and biological monitoring, permit reviews, point source inventory updates, watershed and aquatic preserve[8] plans, and a variety of other management issues. For example, the FDEP and Districts coordinate on the review of development permit applications that affect stormwater discharge quality and quantity. The agencies impose a higher level of treatment for development drainage to Outstanding Florida Waters (OFW). The IRL basin is fortunate to have a majority of its open water designated as OFW (see Appendix B.1 for OFW listing).

Other state agencies that periodically work with the Districts on IRL SWIM issues are the Florida Department of Agriculture and Consumer Services (regulation of shellfish harvesting in seagrass areas, aquacultural and agricultural management practices, administrative oversight of the local mosquito control districts); the Florida Fish and Wildlife Conservation Commission, especially the Florida Marine Research Institute regarding seagrass and fisheries information; and the Florida Department of Community Affairs.

The Florida Department of Community Affairs is responsible for shepherding the development of local comprehensive growth plans to ensure consistency of local plans to state growth policies (Rule 9J-5 and Chapter 163, F.S.). Certain elements of the local growth plans are intended to guide growth in order to minimize or prevent local development burdens on water resources. It's imperative that SJRWMD and SFWMD review local plans for consistency with the SWIM Plan goals and objectives, particularly for the following elements: Future Land Use, Infrastructure, Coastal Management, Conservation, Intergovernmental Coordination, and Capital Improvements. Local plans can be important mechanisms for transforming SWIM objectives into action. The Capital Improvement element of local plans should accommodate SWIM Plan construction projects that may affect large-scale land use and zoning and are designed to provide regional or watershed benefits.

Regional Programs – Water Control Districts and Florida Inland Navigation District. The Districts are actively engaged with two regional governmental entities: the water

[6] Furthermore, PLRGs may also be heavily relied upon for the development of the FDEP/EPA Total Maximum Daily Loads (TMDLs) as stipulated in the Florida Watershed Restoration Act (Chapter 403.067, F.S.).

[7] FDEP's Division of Water Resource Management, Office of Coastal and Aquatic Managed Areas (aquatic preserves), and Division of Recreation and Parks. FDEP has Central District offices in Orlando and Sebastian Buffer Preserve; and Southeast District offices in Port St. Lucie and West Palm Beach.

[8] For names and locations of the state aquatic preserves in the IRL system, refer to the IRL Joint Reconnaissance Report, Chapter 6 (SJRWMD and SFWMD, 1987) or to FDEP's website: www.dep.state.fl.us/coastal/programs/aquatic.htm.

control districts (a.k.a. "Chapter 298" drainage districts[9]) and the Florida Inland Navigation District (FIND).

In addition to the large canal systems directly managed by SJRWMD and SFWMD[10], there are major, regional drainage systems managed by the seven Water Control Districts (WCDs):

- SJRWMD/IRL Basin: Melbourne-Tillman, Sebastian River, Fellsmere, Vero Lakes, and Indian River Farms Water Control Districts
- SFWMD/IRL Basin: Ft. Pierce and North St. Lucie Water Control Districts

The WCDs are working with the two water management districts (SJRWMD and SFWMD), and the USACE on planned projects (via the IRL-North and IRL-South feasibility studies) that should substantively achieve watershed PLRGs and IRL water quality targets by treating the quality and reducing the quantity of discharges to the IRL from WCD canals. These plans are discussed in Chapters 5 through 7 (Central IRL, South IRL, and St. Lucie River, respectively).

The FIND is Florida's non-federal sponsor allied with the USACE, the federal sponsor, in maintaining the Intracoastal Waterway along Florida's east coast. FIND is responsible for developing dredge maintenance plans, acquiring and developing sites for dredged material management, and, in general, supporting projects that enhance the navigational and environmental/aesthetic features of the IRL's waterways. The Districts, FIND, and the USACE have developed mutual objectives and, thus, cost-share arrangements regarding muck sediment projects because the potential outcome is improved navigation and water quality. Also, methods in dredged material management including the beneficial uses of dredged material can be explored. More information on these projects is provided in the following chapters (especially in Chapters 2, and 5 through 7).

Local Programs. Local programs[11] that are key to the achievement of SWIM objectives include:

- the counties' and cities' local growth comprehensive plans (especially the conservation and infrastructure elements) and NPDES compliance programs,
- the counties' environmental programs (monitoring, species protection, etc.),
- the counties' land acquisition programs pursuant to the IRL Blueway program[12], and
- the counties' mosquito control district programs for rehabilitation and management of impounded wetlands.

It is important to stress that a significant amount of the on-the-ground effort to implement the various urban and watershed remediation projects is and will be expended by local government agencies. It will ultimately fall to the counties and municipalities to achieve many of the watershed PLRGs through their NPDES programs, to acquire and manage many of the environmentally sensitive lands in the IRL Basin, and to manage several thousands of acres of reconnected or rehabilitated wetlands. The Districts have and will continue to guide, assist, and cooperatively fund local agencies in these endeavors.

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[9] There are 7 Water Control Districts in the IRL basin whose general legal authority was originally established under Chapter 298, F.S., General Drainage Law of Florida.

[10] SJRWMD: C-54 canal; SFWMD: C-25, C-24, C-23, and C-44 canals

[11] In the IRL Basin there are more than 30 cities and towns and 6 coastal counties: Volusia, Brevard, Indian River, St. Lucie, Martin, and Palm Beach.

[12] The Districts and counties developed a coordinated approach – the Blueway Program -- to acquire most of the remaining, environmentally critical lands in the IRL Basin (~8,000 acres of wetlands and uplands). More information on this program is found in Chapter 2.

More detail about local government involvement in the SWIM programs is provided in subsequent chapters.

Major Accomplishments and Challenges

Now, after more than a decade of federal-through-local-level attention to the IRL system, significant progress has been made in addressing SWIM issues, goals, and objectives.

We are closer to a more definitive and quantitative understanding of the relationship between water quality and seagrass, and thus, the reasons for seagrass loss or gain. This understanding is an important prerequisite for the development of PLRGs, whose purpose is the improvement of water quality, the major factor influencing seagrass coverage.

Besides the good progress made on the science, there is also good progress taking place "on the ground." Nearly 56,000 acres of wetlands and uplands have been acquired for various purposes – water quality remediation projects, habitat preservation, etc. There is good progress in the removal of large volumes of treated wastewater from the IRL; in the steady, incremental improvements in stormwater management throughout the IRL basin; and in the removal of harmful muck deposits. There has also been a net gain in seagrass coverage of nearly 4,000 acres from 1992 to 1999[13]. The most dramatic gains in seagrass acreage are in areas that have experienced the greatest losses since1943. The long drought in the late 1990s may have been largely responsible for this positive trend, but the cumulative effect of the restoration work now and in the future should help to maintain this trend.

The greatest tangible improvement in the IRL is the hydrologic reconnection of more than 23,000 acres of impounded wetlands since 1989 under SWIM (in addition to the nearly 5,000 acres reconnected through other programs). Impoundment reconnections restore many of the estuarine functions provided by salt marsh and mangrove wetlands.

Equally as rewarding is the positive impact the IRL programs are having on the public. There is a noticeable increase in the awareness of the Lagoon's problems and its ecology, and an understanding of the projects -- federal through local -- that benefit the Lagoon's recovery and management. The public's concern for maintaining a stable, productive community with a good quality of life includes a healthy Lagoon system.

Much has been accomplished, but more work remains to be done to reach targets established for seagrass and coastal wetland restoration. The issues of yesterday -- seagrass/water quality, coastal wetlands, and public awareness -- are still the issues of today. They should also be regarded as the issues of tomorrow, because even in the aftermath of restoration success, preventative safeguards, vigilance, and education are necessary so that the issues do not again emerge as problems for the Indian River Lagoon.

[13] 65,717 acres of seagrass in 1992; 69,692 acres of seagrass in 1999

References

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